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Application of innovative teaching-learning methodologies in the classroom. Coaching, flipped-classroom and gamification. A case study of success

C. Gómez-Ejerique, F. López-Cantos*

Dpto. de Ciencias de la Comunicación. Universitat Jaume I, Avda. Vicente Sos Baynat, s/n, 12071 Castellón de la Plan, Spain.

* Corresponding author: Email: flopez@uji.es; Phone: + 34 964729906

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Abstract

The new teaching techniques based on avant-garde methodologies aimed at enhancing student learning are being promoted at all levels of education for a few decades, integrating the significant advances that are taking place in different scientific disciplines, including from the areas of psychology basic and group up to the most effective techniques of talent management and organizations.

In the present work, we review the teaching-learning techniques and methodologies that we consider most efficient at present, with examples that show their suitability for current teaching. The application and effectiveness of coaching and gamification techniques and the innovative pedagogical strategies integrated in the so-called flipped classroom are analyzed. The results obtained with the application of these methodologies allow us to conclude that the analyzed pedagogical tools are ideal to increase the learning capacities and personal development of the students.

Keywords

Education theory, teaching methodologies, coaching, gamification, flipped-classroom.

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1. Introduction

The notable increase in the use of the terms gamification, flipped classroom, and coaching in the educational discourse of a few years to this part is a good example of the significant changes that are taking place within the institutions and among the different groups that They make up the educational system (Hargreaves, 2004-2006, Claxton, 2008). And this growing tendency indicates, even with the own chiaroscuros that accompany the application of these new educational methodologies as a result of their novelty and lack of institutional consolidation, that the new teaching-learning techniques are not a passing fad anymore. And, just as it is happening in other areas, such as in the business in which there is already talk of "executive coaching" normally, these new cutting-edge teaching tools are demonstrating their effectiveness in the learning processes and knowledge construction.

The application of these new methodologies and techniques are intended, first and in general, to facilitate significant improvements in the students' cognitive and relational-communicative abilities and, therefore, to facilitate learning and growth processes. And the new teaching-learning techniques based on gamification strategies, in the so-called flipped classroom, as well as the talent and creativity management tools for the development of people and organizations based on educational coaching are here to stay.

The new educational methodologies that are analyzed in this paper apply collective and down-up learning models and grow-up techniques from the implementation of enquiry-based pedagogical strategies and tools (Wang, 2012) and gaming-based learning (Gros, 2007; Chorney, 2012; Albretch, 2012), as well as innovative methodological proposals such as those integrated in the flipped classroom (Baker, 2000, Sam and Bergman, 2014, Strayer, 2014) and coaching techniques (Wolk, 2007, Harvard Business Esentials, 2005; Bandura, 1997) that are oriented, unlike classical methodologies, to promote the development and autonomous learning capacity of students.

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1.1. How do we learn?

This question is the first question that all teachers should know how to answer when they enter a classroom. Knowing first of all how we learn is essential to concentrate all efforts on achieving a meaningful and lasting learning over time, that creates solid foundations on which to move forward and that is able to keep the student motivated, responsible and able to learn significantly. The objective of education should not be other than to teach students to learn to learn, nothing to do with the commitment of the educational system to prepare them to pass exams and pass one test after another. Learning should allow to acquire new knowledge and also new skills that serve the student to face the events of life in a successful way, in a broad sense, so that they can handle the new situations that are presented to them and develop their maximum potential as people.

According to Pérez (2004), educational theories that are more efficient today have tried to explain how we learn by overcoming traditional pedagogical models and approaching the educational process from new perspectives.

The traditional teaching models focused all the responsibility of the educational process on the teacher considering the student a passive subject receiving knowledge. In this teaching-learning model, which, although obsolete is still common to find in our classrooms, it is only intended to transmit concepts that have to be memorized and without addressing the learning process as a whole.

The reaction to these archaic forms of teaching began to take place a few decades ago from different perspectives. In Latin America, for example, what was known as the pedagogical theory of liberation, promoted by Freire, developed in the 60s of the 20th century in a very particular political context in which models of change and change are promoted. transformation and knowledge is considered a continuous process where the use of dialogue and peer interaction between teacher and student becomes important. No doubt an interesting and applicable proposal in our environment, beyond that in its origins was developed more as a political action than as a pedagogical theory, and

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therefore it is known as the "pedagogy of the oppressed". What interests us about this theory is that it defends that education should not interfere with creativity, curiosity and, much less, the development of students' potential.

In a similar sense, other pedagogical models have responded to classical teaching methods, such as the one known as non-directive pedagogy model, which deals with human development from the perspective of the theories of evolution and the constant biological tendency towards personal fulfillment. inherent to each individual, giving special emphasis to the process of valuing life experience as satisfactory or not depending on its adaptation to the innate improvement objectives of each person. Therefore, any experience that is perceived as contrary to this assessment, to improvement and constant updating, is considered negative by the individual and, therefore, the little flexibility of traditional pedagogies does not contribute to facilitate a good experience of the students . In what we are interested in this pedagogical current driven by Rogers (1992), the role of the teacher must not constrain the development potential of students, on the contrary has to create the right conditions for these to unfold in all its breadth and, therefore, that a climate of understanding, acceptance and respect is favored in the classroom.

Classical methods of teaching are far removed from ontogenetic mechanisms and the processes of development and learning in the terms in which Piaget expressed himself, as biologically conditioned and destined to an ever better understanding of reality and the environment in which develops each individual in a process of perpetual, dynamic and flexible adaptation (Piaget, 1968). And, in this line, other forms of approaching the teaching-learning process that start from psychology, such as the so-called cognitive model (Neisser, 1976; Chi, Glasser and Farr, 1988), are also inscribed, in which it becomes special emphasis on the specificity of each individual and the necessary adaptation of pedagogical methodologies to the characteristics of cognitive processes in general, which are hardly tolerated by direct and exclusively rote-based teaching methods.

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Nowadays, the theories with which we approach teaching-learning processes are based on structuralist models that, with different perspectives, understand that the systems of symbols and discourses that sustain the belief systems, attitudes and expectations that determine the way of acting of each person have both an individual and collective character and mould the culture itself as well as the development of each individual. The knowledge, therefore, as far as we are concerned, can be understood as an individual and cultural construction in which the educational process has a major role.

In that sense, in education, the most essential is the way in which each student builds that knowledge but, over all, how the student uses it and the validity and effectiveness of the learned experiences in front of the vital situations he or she faces every day. Therefore, the role of the teacher comes first to know how his or her students build knowledge and from there to design the strategies that can be implemented to collaborate with the student to develop his or her learning, always with flexibility and adaptability and taking into account the context in which each student builds his or her values and integrates his or her experiences.

In sum, and without extending much more, the way in which we learn has nothing to do with directing and conditioning methodologies and, quite the contrary, these are totally counterproductive and harmful for the proper development of the teaching-learning process and, in consequence, to achieve the goals of properly preparing the student to face his or her vital journey by promoting his or her cognitive development and personal growth.

So learning is a cognitive, social and cultural process, and it is more effective when approached in a contextualized manner and taking into account the student's own features. And the teacher should promote group work and interaction with the student, and should adopt the triple role of *researcher*, to know who the student is; as mentor, to direct his or her learning in the most appropriate way; and as *facilitator*, to enhance the capabilities of each of the students.

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1.2. Then, how should we educate?

Do we teach 21st century students? Times are changing but, as it often happens, the methodologies and practices have done so to a lesser degree and they scarcely suit to the pedagogical tools and technologies we use today. And teachers can, and they should introduce the broad set of educational resources available to them that have amply proven to be effective and with very positive effects. In addition, the teacher must necessarily be a good communicator, he or she must have emotional management capabilities and be prepared for the different situations that can occur in the classroom for which the emotional control of the adult is fundamental.

It is true that many teachers have not received an adequate training, and currently only marginally and often almost by obligation they attend updating and teaching competence and skill improvement courses. But, although it is not an easy task, there is no doubt that the obvious deficiencies can become interesting opportunities of renewal and stimulus to make the classroom and teacher´s work a rewarding and enriching profession, with a some will and dedication. To achieve it, even being an obviousness, it is essential to assume that any person who is engaged in teaching must keep continuously being trained, must be conscious that learning is a life lasting task, and that in the daily practice the teacher must have a high knowledge of teaching tools and methodologies and apply the most appropriate innovation techniques among the many that are offered to us today, to each situation.

It should not be necessary to insist on how inappropriate it is to continue defending master classes and traditional pedagogical methods, but the data that show their inefficiency are overwhelming. If we look at the Pyramid of Learning of Cody Blair (Prieto Gil, 2010), we clearly see that with listening we only retain 5% of the information that is transmitted to us (in the following 24 hours).

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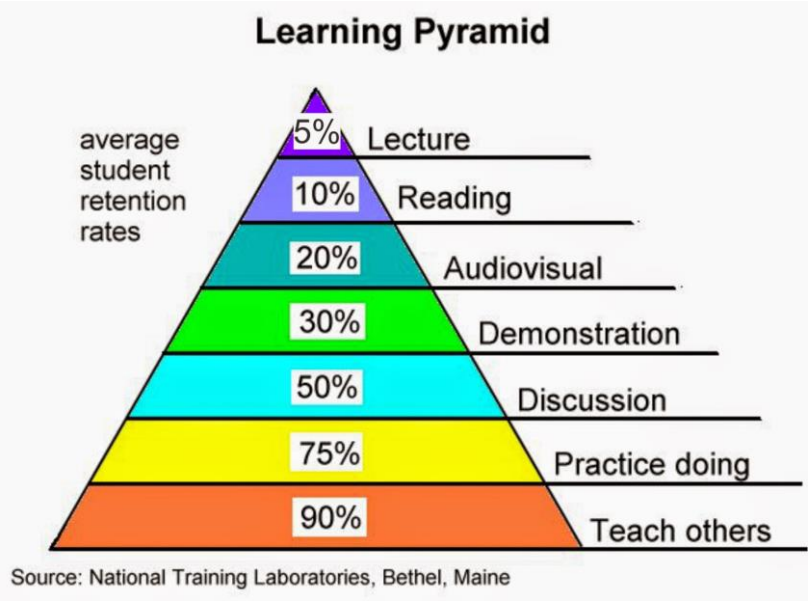

Figure 1 Learning and Retention Piramid

If we continue to descend, we observe that the next strategy with a low learning effectiveness is reading, another of the very common techniques used in Spanish classrooms. Although it is somewhat more effective than listening, it is only 5% more effective.

Audio-visual contents, which cautiously and after many efforts a few decades ago entered in the classrooms, are more suitable for teaching, with a 20% retention rate, but even by themselves they do not have a significant effectiveness. The further down in the pyramid the retention rate increases, reaching 75% when the applied technique is learning by experience.

According to this scenario, the teacher must move from being a passive subject, mere transmitter of knowledge to being a facilitator for learning. He or she should be able to create a trusting environment, an active learning environment, and he or she should be able to awaken the curiosity of the student, to propose challenges, to be updated and to use in his or her classes all the resources and innovative experiences that lead to

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achieving a high quality education. Therefore, bringing up the phrase we inaugurated this text with:

"*Education is not the filling of a pail, but the lighting of a fire*"

2. Methodology

In our study we have applied the coaching and gamification techniques and flipped classroom teaching methodologies in a real learning environment in the classroom in collaboration with the teachers responsible for the subjects.

In our research we have analysed, as a priority objective, the effectiveness of the coaching techniques applied to education. To achieve it, we have selected a sample of 12 teachers who teach classes in the different ESO[1] courses (Mandatory Secondary Education) in a concerted school in the city of Valencia (Spain), and we have trained them to apply this above mentioned techniques to analize this performance in the classroom.

To analyse the application of gamification and flipped classroom techniques, a total of 49 students have been selected; (24 students) in an ESO 3rd degree group and another (25 students) in an ESO 4th degree group.

The analysis of each of the techniques has always been developed following the below explained phases:

To begin with, extensive personal interviews were conducted with the teachers who were invited to participate in the study. Then, after that first personal interview, we determined the teachers' predisposition to introduce the proposed techniques and we gathered their impressions in relation to the deficiencies that their students would have, according to their perception, as well as the general problems they meet in their teaching practice.

[1] *Translation note.* ESO: Spanish acronym for Mandatory Secondary Education.In Spanish current Education System, kids start the first of the four degrees the ESO has, at the age of 13 years old.

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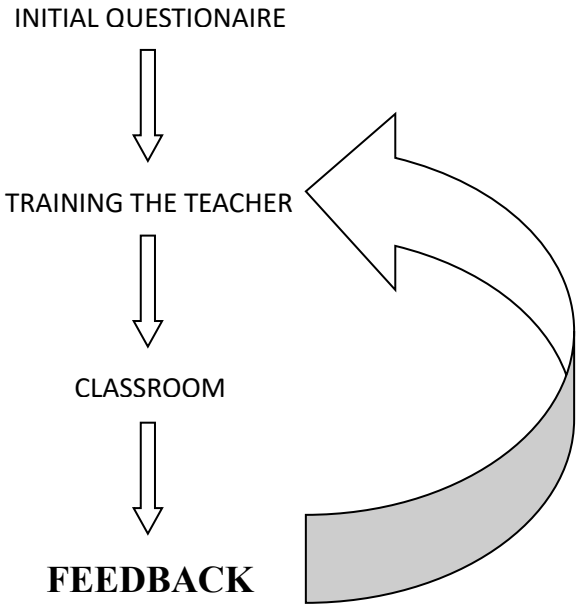
Afterwards but prior to the application of each of the analysed techniques, the students were asked to respond to a semi-structured questionnaire in the same terms that had been used with the teachers.

Finally, and after the application in the classroom of the methodologies to be analysed, both the opinions of the teachers and of the students were again collected, in the same terms used in the beginning, to analyse the influence and effectiveness that the tools applied had had.

We have had the collaboration of the teachers in each of the sessions we have devoted to apply in the classroom the different analysed techniques, so that during an academic year the work dynamic was:



We will now expose the features and pedagogical relevance that the different techniques are presumed to have in the classroom and that we have analysed in our study sample and in a real environment to determine its degree of applicability and effectiveness:

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2.1 Coaching

Coaching is a relatively new discipline that broke into our vocabulary in the 80s, spreading with greater strength in our daily life in recent years. Although it currently has great media notoriety, its origins are not entirely clear, since coaching is nourished by different sciences, disciplines, thinkers, just as there is no unanimity when defining the term itself.

For our purposes, coaching can be considered a methodology whose objective is the personal and professional development of individuals. It is a process that occurs as an interaction between two people, the *coach* and the *coachee* (the client or person willing to make a change), in which the aim is to transform a current state (unwanted) into another state desired by the coachee in a specific context. It is important to bear in mind that coaching is in consequence focused on both the present moment and on the exploration and the vision of a desired future.

To achieve this the coach uses different methods and tools that generate in the coachee perspective changes; conscience, commitment and responsibility boost; increase of the desire of learning, and development of the already existing capacities so as to facilitate an impulse to the action that will revert in reaching the proposed goals.

The aim of coaching is to discover and release the full potential of the persons, to bring to light all the resources they possess to achieve their purposes. It understands that the person has the skills to achieve the desired goal and in the process the coachee will discover and use them to achieve his or her goals.

Coaching is therefore a process that invites us to experiment and to learn from our own experience. It invites us to use different ways to obtain our goals, to explore new ways of performing to reach our objectives. The coach is understood as a catalyst of the change process. As someone who is able to see the coachee not as what he or she is but as what he or she can become, and who understands that he or she has all the resources to produce that change.

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This said, we are going to address all those techniques which we have trained the teachers on, and which they can use to achieve more dynamic classrooms, more motivated students and thus to achieve meaningful learning.

2.1.1 Coaching training given to teachers for their application in the classroom

All these techniques should be integrated by the teacher before applying them in the classroom in order to be able to extract a better harnessing out of them, that is why the first sessions in the process were dedicated to it, prior to the beginning of the academic year and then we run control and reinforcement sessions throughout the teaching period.

1) Creativity

As Esquivias (2004) states: "Creativity is a concept that alludes to one of the most sophisticated cognitive processes of the human being ... it cannot be approached as a simple feature of human beings, it is undoubted that aspects such as: the mind, the cognitive processes that take place in it, the personality, the motivation, the emotions and the affective world play a singular component in this process." And he continues: "On the other hand, we are all creative to a greater or lesser extent and what is even more encouraging, we can all develop it ".

To be creative is, therefore, to be curious, to get out of the marked paths, to be opened to the world and to be receptive to everything that surrounds us, to discover ideas that have the potential to unite and form something new. But also reorient our mind to unexpected directions, to be able to see new ways, to relate concepts that seemed to have nothing in common and, in summary, to be in the world in a certain way that encourages openness, exploration and changes.

In this sense the teachers were trained to:

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- Observe as they had never done before.
- Increase the student's awareness. Keep the student here and now.
- Practice active listening with the student and have a perception of the environment.
- Introduce anti-routine changes.
- Use the Sleep-writing technique.
- Use the Brainstorming technique.
- Use the Six Thinking Hats technique, by Bono.
- Use the lateral thinking.

2) Powerful questions

One of the tools that make a coaching process effective is the open questions or powerful questions. These types of questions are those that cannot be answered with a yes or a no. These are questions that invite us to deepen in the discovery, in the awareness, drive us to action or reflection. In general, they are questions that lead us to introspection and of course they invite us to look inwards or into the future.

For this reason it is important that the teacher uses these types of questions with his students, to increase their curiosity, to invite them to reflect, so that they can investigate inside, although first it is convenient to do them as a teacher.

Teachers were given a battery of questions for their own reflection and its application in the classroom adapted to the students, such as:

- How do I contribute with as a teacher?
- How does teaching contribute to me?
- What resources do I have now?

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• How far would I like to go?

• What resources do I need to achieve the given goals?

• Why do I want to teach?

• How do I think I am doing so far?

3) Marc SMART goals

It is very important to get goals set, as this increases motivation, therefore, the teacher was trained in techniques to motivate their students with very clear objectives that meet the requirements known as SMART requirements:

• S (Specific). The objective has to be specific, the more the better.

• M (Measurable). The goal has to be quantifiable.

• A (Attainable). The goal has to be achievable.

• R (Realistic). The objective must be realistic.

• T (Timely). The objective must be time bounded.

4) Achieve commitment to the objective

Teachers have also been insisted that students must commit to the objectives proposed at the beginning of the course. Teachers in the classroom should regularly explore to what a student should say yes, and to what he or she should say no; that is, what they should give up in order to achieve their objectives. The same thing happens to the teacher, who should review at all times if some resignation needs to be made to achieve those goals, because choosing always entails a renounce.

This coaching technique makes it easier for the teacher to make his or her students responsible for their own learning by making them aware of what he or she is saying yes to and what he or she is saying no to.

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5) Working with the "saboteur"

We call saboteur anything that prevents us from moving forward, that does not let us reach the goal and as a teacher we must prepare ourselves to know the saboteur, our own and that of our students. To try to find out in what ways the saboteur appears we suggest some questions like:

• Where do I let my energy escape?

• At what point am I breaking my self-commitment?

• How am I being too flexible?

• When do the resistances appear?

• What comfort zone do I have to abandon to achieve my goal?

• How do I limit myself?

We carried out this work with the teacher on a regular basis and once he became aware of what was preventing him or her from moving forward, we worked with that limitation to be able to permanently eliminate it. In the same way the teacher worked this aspect in the classroom with his or her students.

6) The wheel of life as a tool for measuring results.

Teachers have been trained in the use of this evaluation tool that can give us a good starting point of how the teacher and the student are, to set with them the group or individual objectives to be achieved. With it we get both an individual and joint vision that allows us to evaluate at all times the status and results throughout the process.

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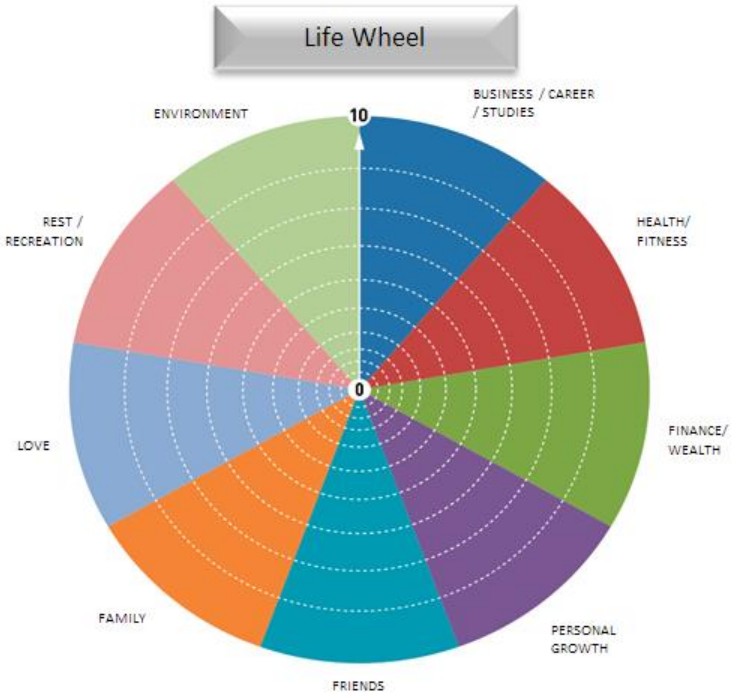

Figure 2 Life Wheel (Source: Personal Excellence.co)

7) Give the students an effective feedback

Finally, in our methodology, feedback is crucial to determine if the proposed objectives are being met and if corrections and improvements in the implementation of the teaching-learning plan need to be introduced.

Feedback to be effective must be positive. Rebuke if possible in private and recognize and congratulate in public.

2.2 Flipped Classroom.

The flipped classroom model arose when professors Jonathan Bergmann and Aaron Sams (University of Colorado) began recording science classes for students who could not

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attend to the classrooms. They realized that the marks of these students were very good, so they continued to record videos and extended it to the whole group of students in the classroom. Nowadays it is already a widespread practice in many schools around the world. According to its promoters, Sams and Bergman (200), the *flipped classroom* technique is a pedagogical approach in which direct instruction moves from the individual learning space to the group learning space and the resulting space is transformed into a dynamic and interactive learning in which the teacher guides students as they apply the knowledge and they can actively participate in the task.

It is a model that has been proven efficient, beyond fashion, since it allows the teacher to have more time to establish relationships with students in the classroom and improve interactions with them. For this reason the teacher will know better how each of the students works, so that the instructor can improve the teaching strategies in the classroom and can know what motivates the pupils, so that the students will feel that the teacher cares about their learning and this will increase their motivation. Let's remember that without motivation there no learning is possible.

In the flipped classroom methodology, the student has worked individually, brings to the classroom some already clear concepts and –possibly- also some doubts, so that in that group space the pupil can solve them and integrate better individually. The teacher is necessary to be a facilitator, an expert at that moment in the class. Later the student will integrate the acquired knowledge and skills and from that moment the pupil will be able to carry out projects or solve more complex challenges.

To achieve this, the student has had to prepare the material before arriving to the classroom and the teacher has to be very clear about what the student has to do during the class time. The classroom must be a learning space with a high interaction among students and between teacher and students; thus, we are talking about active learning. The students will work in groups or individually, so that several situations are generated in the

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class and the teacher will interact with each of the students, being able to personalize the learning according to the needs of each one.

2.2.1 Application of flipped-classroom methodology in the classroom with students.

Teachers were trained in this technique, stressing that its implementation required following good programming and preparation in order to have an impact on less work and a higher quality on their relationship with students and also on a better performance.

The tool used was a video related to the topic to be addressed, selected by the teacher and the methodology was developed in the following application phases:

1. Before the class: The teacher provided the students with audio-visual material to visualize and work on it at home individually, the day before the class session.
2. During the class: A group work space was established in which the study material was analysed, questions were answered, knowledge was settled and various related activities were carried out, together with the teacher.
3. After the class: A project was proposed based on challenges, and that involved the realization of teamwork in a complementary way to the performance of individual activities of greater complexity.

2.3 Gamification.

In the field of education there are several success cases related to the use of games (Diaz and Troyano, 2013). Gamification is defined by Zichermann and Cunningham (2011as a process related to player thinking and game techniques to attract the users and solve problems or as the use of mechanisms, aesthetics and the use of thought, to attract people, encourage action, promote learning and solve problems. Teachers have been insisted that the purpose of gamification is to influence the psychological and social behaviours of the player and to produce and create experiences that generate feelings of control and

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autonomy, especially critical skills for the cognitive development in the educational stages the students analysed in the study are in.

Throughout the teaching period, we have also dedicated some sessions with teachers to train them in gamification techniques and in the use of the *Kahoot* tool.

3. Analysis and Outcomes

3.1 Case Study 1. Coaching.

We worked during the academic year with the 12 teachers selected from the stage prior to the beginning of the classes. Teachers who were part of the study sample were initially instructed in the life wheel and the leadership wheel in class, jointly analysing the strengths and areas to improve that they had to measure in their students.

The following aspects were taken into account: responsibility for the study, discipline, individual studying hours, participation in the classroom, interest in the subject, concentration and active listening in the classroom, material organization, task planning, punctuality, relationship with their colleagues and relationship with the teacher.

At the end of the course, after having followed with them both individual sessions and group sessions, both the life wheel and the leadership wheel were again passed to the students in the classroom, checking that the scores had remarkably increased in all the areas. The teachers, on the other hand, showed a high index of satisfaction and pointed out significant improvements in everything related to their feeling of personal and professional fulfilment at work.

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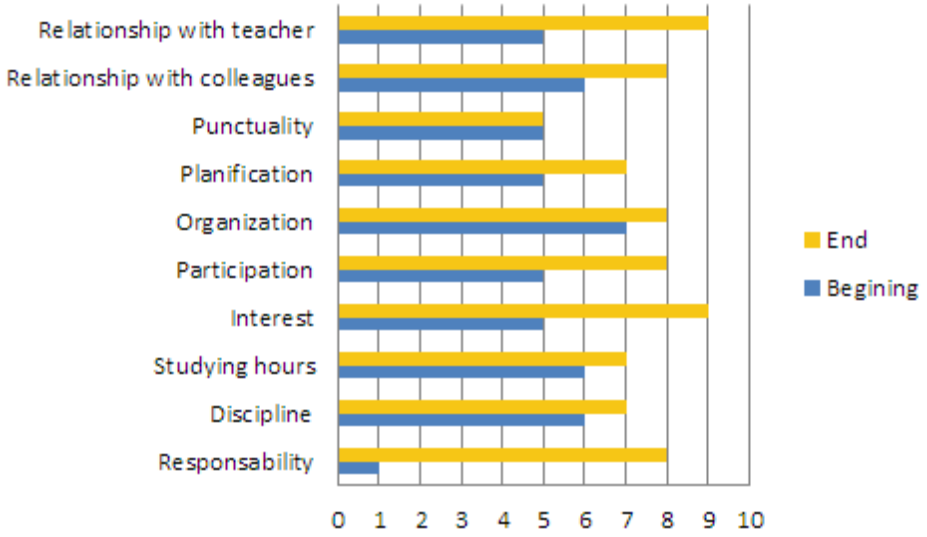

Figure 3 Performance improvement.

As can be derived out of the responses of the 49 students who participated in the study, the items "relationship with the teacher", "responsibility for the study", "interest in the subject" and "participation in the classroom" had significantly improved in cases where the teacher was actively coaching in the classroom.

3.2 Case Study 2. Flipped Classroom.

The 24 students in ESO 3rd degree studying the subject of Physics and Chemistry made a practice of decantation in the laboratory, which is a physical method to separate the components of heterogeneous mixtures (in this case water and oil), and a filtration, which is a process by which an element is passed through a filter to separate its parts, being retained those that do not pass through its size and being filtered those that do pass through the filter space (in this case sand and water).

Before, the way of working was to take the students to the laboratory and to begin the explanation of the practice there. What it used to happen was that not everyone would

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understand it at first, one or more class sessions were used to explain the procedure and even so, when it came to performing the practice, not everything was clear.

As part of our research and under our supervision, the teacher applied the flipped classroom methodology for the same didactic unit that had been very difficult to learn to the students so far.

Before the practice and in their homes, each student watched a video where the two separation techniques that were going to be carried out in the laboratory were clearly explained. After the video they had as a previous task to answer a series of questions that were considered necessary to understand in order to perform the practice. This way, if the student after viewing the video did not know how to answer the questions, he would watch it as many times as he would need it until he would be able to answer them. On the other hand, they were provided with a written protocol of the practice, which was nothing more than what they had seen in the video but in written script.

Once in the laboratory they saw the videos again, they shared their opinions, they resolved the doubts and we made sure that they had understood well both the task to be carried out and the foundation of the practices, that is, the purpose of the practice.

When everything was clear, the students in groups of four generally did the practice. The teacher was able to solve doubts and difficulties and they could even watch the videos again at that time because, with this methodology, the students have great autonomy in the laboratory because they are clear about what they have to do and how they should do it.

By the end of the practice the students had to prepare a memorandum with the following structure: objective of the practice, methodology used, material used, results, drawings and also reporting everything that happened to them or that had surprised them during the execution of the practice.

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After using the flipped classroom methodology with the Physics and Chemistry class, we conducted a survey on the 24 students participating in the pedagogical experience and these were the results obtained:

1. Do you think that the viewing time of the videos in your house increases the time you are in front of the computer screen? 85% answer *no*.
2. Has the video helped you to better understand the practice? 100% answer *yes*.
3. Have you always watched the videos before the practice? At the beginning, only 50% answered *yes*, but at the middle of the course 85% would have watched the videos.
4. Have you easily accessed the videos on the internet? 100% answered *yes.*
5. Has it been important for you to have your queries prepared in order to be more efficient in the laboratory? 85% answered *yes*.
6. Did you need to check the video again during the lab practice? 35% answered *yes*.
7. The teacher was asked why he thought it was useful to apply flipped classroom in the area of sciences and the answer was that he or she could save explanation time in the laboratory, the practices could be done in the scheduled sessions, something that previously did not happen and that the accidents in the laboratory had decreased as a result of the previous visualisation of the practices.

The joint analysis of the results with the head of the subject led us to conclude that, unlike the traditional methodology used until then, if the students watched the videos before the practice they would know ahead the method that was going to be use in the laboratory and for the teacher it was much easier to start the work in the laboratory and the teaching-learning process was much more effective applying the flipped classroom methodology that we had implemented.

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3.3. Case Study 3. Gamification.

We use gamification techniques in collaboration with the classroom teacher in ESO 4th degree, during a year. We first trained him in the use of teaching-learning tools insisting on the fact that for any playful activity to provide meaningful learning it had to be well designed and with a good execution and conclusion.

In this specific case the *Kahoot* game was used as a learning tool in the subject *Sciences Applied to Professional Activity*. A series of questions were designed for each didactic unit and the game was carried out during the development of the class session in groups.

At the end of each content block, the same questions were taken as an exam. The result during the course was that the 25 students passed the partial exams done at the end of the game, obtaining in the final exams of the subject surpassed by 95% of the students with results well above the average of the previous courses.

Both the teachers and the students answered the final questionnaire of the subject indicating that they had better disposition throughout the whole teaching-learning process, and all indicated that this methodology was much simpler and more effective to assimilate the contents of the subject, showing clearly that the introduction of gamification tools in the classroom is of great pedagogical utility and facilitates meaningful learning.

4. Discussion and Conclusions

In this research, we have made a review of the joint application of coaching and gamification and flipped classroom techniques in the classroom and have proved that they enhance both the professional motivation of the teacher and the development of students and their academic performance.

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Researches carried out in recent years show that once children enter school, no other factor is as important for their development as the quality of teachers (Bruns and Luque, 2014).

Our main conclusion is that the joint application of these pedagogical techniques facilitates the improvement of the students' relationship with the teacher, who determines the effectiveness of teaching. Among all of them, we understand that coaching is a very useful tool for teachers as a constant improvement tool applied both to their professional practice and to improve the relationship with their students and facilitate their teaching-learning process.

We also understand that the results and conclusions obtained in this research reinforce the idea that in the education system there must be a revolution both in the approach and in the techniques that are currently applied in the classroom, since they are still very aligned with the traditional teaching methodology. Likewise, the continuous learning of the teachers cannot comprise isolated courses without connection among them, but they need to keep coherence and a mission that is to provide the teacher with valid tools for the students of the 21st century.

In summary, it is necessary to promote these avant-garde techniques and teaching-learning methodologies aimed at promoting the development of the students to achieve greater responsibility of the pupils, promote the teacher-student relationship, promote teamwork and, promote significant improvements in the results of the learning process and in the development of students as individuals.

5. References

Albrecht, C.S. (2012). *The game of Happiness. Gamification of positive activity interventions.* Maastricht University. Maastricht, The Netherlands.

https://doi.org/10.4995/muse.2019.9959
ISSN: 2341-2593

Baker, J. W. (2000). "The *classroom flip*: Using web course management tools to become the guide by the side." *Selected Papers from the 11th International Conference on College Teaching and Learning*. 2000.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.

BBVA Innovation Edge (2012). Gamificación, el negocio de la diversión, 3, 1- 65.

Bruns, B. and Luque, J.. (2014). *Profesores Excelentes: Cómo mejorar el aprendizaje en América Latina y el Caribe*. Washington, DC: World Bank.

Chi, M., Glaser, R. and Farr, M. (1988). *The Nature of Expertise*. Ed. L. Erlbaum Associates.

Chorney, Alan I. (2012). "Taking the game out of gamification", *Dalhousie Journal of Interdisciplinary Management, 8,* 1-14.

Claxton, G. (2008). *What's the point of school? Rediscovering the heart of education*. Oxford: Oneworld.

Diaz, J. and Troyano, Y. (2013). "El pontencial de la gamificación aplicado al ámbito educativo", *III Jornadas de Innovación Docente. Innovación Educativa: respuesta en tiempos de incertidumbre*. University of Sevilla.

Esquivias Serrano, M. (2004). "Creatividad: definiciones, antecedentes y aportaciones", *Revista Digital Universitaria*, 1 (5).
<http://www.revista.unam.mx/vol.5/num1/art4/art4.htm>

Gros, B. (2007). *Videojuegos y aprendizaje*. Barcelona: Graó.

Hargreaves, D. (2004-2006). *Personalising Learning*. *Pamphlet, Series*. London: Specialist Schools Trust.

Harvard Business Essentials (2005). *Coaching y Mentoring: cómo desarrollar el talento de alto nivel y conseguir mejores resultados*. Barcelona: Editiones Deusto.

https://doi.org/10.4995/muse.2019.9959
ISSN: 2341-2593

Kapp, K. (2012). *The Gamification of Learning and Instruction: Game-Based Methods and Strategies for Training and Education*. San Francisco: John Wiley & Sons.

Neisser, U. (1976). *Psicología Cognoscitiva*. Editorial Trillas: México.

Padilla, S.; Halley, F. and Chantler, J.C. (2011). "Improving Product Browsing whilst Engaging Users", *Digital Engagement*, 11, 15-17.

Pérez Rodríguez, P. M. (2004). "Revisión de las teorías del aprendizaje más sobresalientes del siglo XX", *Tiempo de Educar*, 10 (5), julio-diciembre, 2004, pp. 39-76.

Prieto Gil, A. (2010). «La pirámide del Aprendizaje». E-Innova BUCM. <http://biblioteca.ucm.es/revcul/e-learning-innova/27/art1263.pdf>

Piaget, J. (1968). *Genetic Epistemology*. Columbia University Press. USA.

Rogers, C. (1961). *El proceso de convertirse en persona.* Buenos Aires: Ed. Paidós.

Sams, A., Bergmann, J. *et al.* (2014). *Flipped Learning Network (FLN). The Four Pillars of F-L-I-P*. <http://flippedlearning.org/wp-content/uploads/2016/07/FLIP_handout_FNL_Web.pdf>

Strayer, J. (2014). "How Learning in an Inverted Classroom Influences Cooperation, Innovation and Task Orientation", *Learning Environments Research* 15.2, 171–193.

Wang, Q. (2012). "Coaching for Learning: Exploring Coaching Psychology in Enquiry-Based Learning and Development of Learning Power in Secondary Education', *Procedia - Social and Behavioral Sciences*, 69, 177–86. <https://doi.org/10.1016/j.sbspro.2012.11.397>

Wolk, L. (2007). *Coaching: el arte de soplar brasas*. Buenos Aires: Gran Aldea Editores GAE.

Zichermann, G. and Cunningham, C. (2011). *Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps*. Cambridge, MA: O'Reilly Media